swim, but not the slightest difficulty was encountered in carrying out the experiment. With the big copper helmets weighted with lead to hold each diver down and connected to hand pumps on the deck by fifty feet of ordinary garden hose, it was possible to walk around in perfect comfort and pass beneath the boat where those above could plainly see every move through the big glass in the floor of the dark-room.

Sharks and barracuda abound in the waters about the Florida Keys, but they were apparently kept off by the strangeness of the apparitions that constantly bubbled great bubbles of air to the surface as they stalked about among corals, sponges and sea fans.

The writer had used the helmets in 1925 while with Mr. William Beebe among the Galapagos Islands and Cocos Island. While there we found that at a depth of thirty or thirty-five feet, the water rose in the helmet about to the level of the diver's chin, compelling him to keep his head erect. In the shallower depth, chosen for the class experiment, water remained probably two inches lower.

The trip was an experiment, but it proved highly successful and similar ones will take their places as part of the regular schedule of course work in the zoology classes of the university.

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SCIENTIFIC THEORIES

THERE are indeed grave objections to the use of the word "belief" as a name for the attitude of a scientist toward a proposition, law or theory which he employs in his thinking, experimenting or writing. Dr. E. C. L. Miller's communication in the issue of SCIENCE for March 23 is very pertinent.

His letter suggests to one reader who has given some thought to this matter in recent years such questions as these:

(1) Why should not some of our able popularizers and socializers of science employ their skill to disseminate a knowledge of and an interest in the scientific attitude and method as well as in more transient information in regard to scientific progress? There are opportunities from time to time, as, for instance, when Einstein spoke with such complete detachment of how his theory of special relativity must fall if the Dayton Miller experiments showing ether drift should be confirmed. "Experiment is the supreme court," said he. This might have been dramatized. Fully utilized, his attitude might have done quite as much for the advancement of science as the Miller experiments.

(2) Why should it not become a fixed policy of writers and publishers of text-books in science to see to it that every science book in the future should contain a page or two, at least, intended to make clear to students that there are certain scientific attitudes common to all sciences which are even more important than the specific information constituting a particular science?

(3) Why should not every teacher of science who reads Dr. Miller's letter or this, attempt to formulate for himself and for his students, a little more carefully than he has heretofore, his own conception of the difference between scientific "acceptance for use" on the one hand and "belief" on the other?

In the institution from which I write a considerable number of students have been taught each year recently that real scientists do not believe their theories and laws as other people believe their inherited and absorbed beliefs; that scientists use their generalizations as tools of thought and guides in experimentation and observation; that, in their more rational and more philosophical moments, at least, scientists do no more "believe" their theories, laws, etc., than they believe a benzene ring diagram or a logistic curve. Their generalizations work to correlate and coordinate concepts, observations and experiences with one another. That is enough.

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SCIENTIFIC BOOKS

Entomologie d'Haiti. By GEORGE N. WOLCOTT. Republic of Haiti. Published under the direction of the Service Technique du Département de l'Agriculture et de l'Enseignement Professionnel. Port-au-Prince, Haiti, 1927. 440 pp., 133 figs., 8vo, cloth.

THIS volume, which is the second of a series of works written for the use of the students of the Central School of Agriculture of Haiti, is far more than the usual government or state bulletin.

It is necessarily largely a compilation of the facts known to every entomologist, which form the basis of the study of insects, and yet Dr. Wolcott has given his book quite a tropical flavor. The reader will be surprised at the start by the many excellent illustrations, many original and by the author or by M. Fritz Maximilien.

The work begins with a short discussion of entomology as a science and as a branch of zoology. The next chapter is headed "Les Arthropodes," and defines the members of this group and gives much interesting information.

The external anatomy of insects is next taken up, then internal anatomy and then development.

Several chapters are grouped under "Ecologie des Insectes," and treat ecology as a science, insects in their relation to plants, insects in their relation to other animals, interrelations among insects, insects in their relation to environmental conditions, psychology of insects, insects in their relation to man, the war against insects—the latter a discussion of economic poisons.

A number of chapters are grouped under "Ordres des Insectes," and here Dr. Wolcott follows Comstock in a general way, though giving prominence in tropical forms.

The last group of chapters has the heading, "Entomologie pour le Fermier," and after a brief introduction we find discussions of insects which attack sugar cane, coffee, tobacco, fruit, truck crops, stored products; then household insects, parasites of poultry, insects attacking animals, insects attacking man.

The reviewer ventures to think that Dr. Wolcott's book would be of value not only in Haiti but in other French colonies as well. An English translation would, he feels sure, be of use in this and other countries.

Both Dr. Wolcott and the department of agriculture of Haiti, which made the work possible, are to be heartily congratulated.

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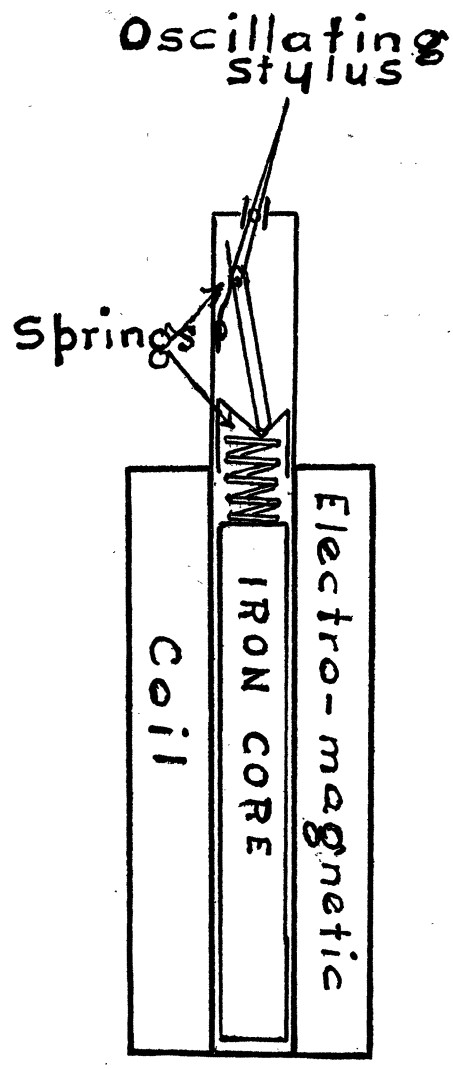
SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE AND ACCURATE TIME MARKER

THIS time marker takes advantage of the fairly constant frequency of the ordinary alternating current lighting circuit. There are three forms of it that we have considered. The first and simplest consists of a single light reed whose period of vibration is the same as the frequency in the A.C. line. The reed is actuated by a suitable small electromagnet.

The second form of this time marker, which is depicted in Fig. 1, may be looked upon as a modification of the synchronous reed. It consists of a system of levers and a movable soft iron core in an electromagnet. One or more springs, helical or linear, furnish restoring forces. This second form may be designed to be quite powerful. The mechanism which we have modified and used was obtained in the market in the shape of an electric safety razor. It is shown schematically in Fig. 1. These time markers, which may be constructed in the form of a pencil, will require little space and may be readily mounted with any desired freedom of adjustment. It is not easy to construct such a system as that shown in the drawing to have a natural frequency equal to that of the A.C. line. Furthermore, its wave form may not very closely approach a simple sine wave. There are



advantages and disadvantages in having harmonics present in the time graph.

Applying a somewhat different mechanism from the two forms just described for the registration of time intervals of the alternating circuit, we have attempted to employ as the third form of time marker a synchronous motor such as is used in the electric timepiece which is sold under the trade name of Telechron. This apparatus can be made not only to indicate the smallest time interval that may be estimated on the drum, but also, by proper gearing, it can be made to indicate on the graphic record each tenth of a second or other desired interval. It is this form which we hope to set forth in greater detail in the near future.

We would like to emphasize that such synchronous A.C. timing devices are extremely convenient and sufficiently reliable for many ordinary laboratory purposes. In the Cleveland district the potential cycle known as the 60 cycle circuit is constant within a quarter of a cycle from day to day. This means that